

REMARKS

In response to the above-identified Office Action, Applicant seeks reconsideration of the application. In this response, no claims are canceled, no claims are added, and no claims are amended. Accordingly, Claims 1-19 are pending.

I. In the Abstract

The Abstract of the invention is objected for various informalities. The Abstract has been amended and a replacement sheet of the Abstract is attached to this Response. Withdrawal of the objection to the Abstract is respectfully requested.

II. In the Title

The title of the invention is objected to as not being descriptive of the invention. The title has been amended as suggested by the Examiner. Withdrawal of the objection to the title of the invention is respectfully requested.

III. Claims Rejected under 35 U.S.C. §103

Claims 1, 4-8, 11-14 and 17-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 005774710A to Chung (Chung) in view of U.S. Publication No. 005878255A to Tran et al. (Tran). Applicant respectfully traverses this rejection.

Claim 1 recites a method comprising: [1] determining a target of a branch instruction; [2] storing the target of the branch instruction; [3] [the target of the branch instruction is stored] before the branch instruction is fully executed; and [4] re-encountering the branch instruction and predicting a target for the branch instruction by accessing the stored target for the branch instruction. In rejecting Claim 1, the Examiner asserts that Chung teaches limitations [1], [2] and [4]; and asserts that limitation [3] is taught by Tran. Applicant respectfully submits that combination of Chung and Tran fails to teach or suggest all of the limitations recited in Claim 1.

In the Office Action, the Examiner correctly notes that Chung “does not that mention that the target of the branch instruction is stored before the branch [instruction] is fully executed.” As to this claim limitation, the Examiner asserts that Tran teaches allowing “branch prediction information, including branch targets … to be updated speculatively i.e. before the branch [instruction] is fully executed”, citing column 10, lines 21-27 and column 2, lines 63-63 of Tran.

Based on the Examiner’s analysis of Claim 1, it appears that the Examiner is arguing that although Tran does not expressly disclose that the target of the branch instruction is stored before the branch instruction is fully executed as recited in Claim 1, Tran is inherently capable of storing the target of the branch instruction before the branch instruction is fully executed.

To establish inherency, the extrinsic evidence “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 U.S.P.Q. 2d 1746, 1749 (Fed. Cir. 1991). “Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” Id. At 1269.

Applicant respectfully submits that updating branch prediction information speculatively as mentioned in Tran does not necessarily require that the target of the branch instruction is stored before the branch instruction is fully executed. It is possible to update branch prediction information speculatively as mentioned in Tran and store the target of the branch instruction after the branch instruction has been fully executed. As mentioned above, inherency may not be established by probability or possibilities. However, there is nothing in Tran that teaches or suggests that the missing claim limitation is necessarily present in systems described by Tran.

Thus, Tran fails to disclose storing the target of the branch instruction before the branch instruction is fully executed, as recited in Claim 1. Instead, Tran merely indicates that the branch prediction information is updated speculatively. This may be no different than what is disclosed in the background section of the present patent application, which indicates that Branch Prediction Unit (BPU) of prior art system (BPU is typically used to generate branch prediction information speculatively) stores a branch target of a branch instruction after the branch instruction has been fully executed. There may be a number of disadvantages associated with such prior art systems. Because the branch targets are allocated to the BPU after execution, the BPU will not have the calculated branch target if the branch instruction is re-encountered (several times, perhaps, if the branch instruction is part of a small loop) before the first occurrence of the branch instruction has been fully executed. This may result in large misprediction penalties when processing programs which are highly dependent on small loops since a branch instruction may be re-encountered several times before the initial occurrence has been fully executed.

Such a problem would not occur with the method recited in Applicant’s independent Claim 1, which is capable of storing the target of the branch instruction before the branch instruction is fully executed so that when the branch instruction is re-encountered, the target can be predicted for the branch instruction by accessing the stored target for the branch instruction. For the above stated reasons, Applicant respectfully submits that the combination of Chung and Tran fails to disclose every limitations of Claim 1.

As to independent Claim 8, Applicant respectfully submits that the combination of Chung and Tran fails to disclose or suggest “a cache to store the target of the branch instruction before the branch instruction is fully executed” and “a branch prediction unit to, upon re-encountering the

branch instruction, predict the target of the branch instruction by accessing the target of the branch instruction stored in the cache,” as recited in this claim.

With respect to independent Claim 14, Applicant respectfully submits that the combination of Chung and Tran fails to disclose or suggest “a cache to store the target of the branch instruction before the branch instruction is fully executed by the processor” and “a branch prediction unit to, upon re-encountering the branch instruction, predict the target of the branch instruction by accessing the target of the branch instruction stored in the cache,” as recited in this claim.

In view of the foregoing, Applicant respectfully submits that independent Claims 1, 8 and 14 are patentable over Chung in view of Tran and requests withdrawal of the rejection of these claims. Regarding dependent Claims 4-7, 11-13 and 17-19, Applicant submits that these claims are not obvious in view of the cited references at least for the same reasons given in connection with their base Claims 1, 8 and 14.

In the Office Action, Claims 2, 3, 9, 10, 15 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung in view of Tran and further in view of U.S. Publication No. 006601161B2 to Rappoport et al. (Rappoport). Applicant respectfully traverses this rejection.

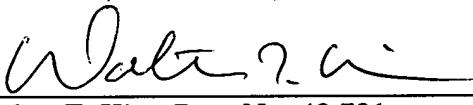
As Claims 2, 3, 9, 10, 15 and 16 are each respectively dependent on independent Claims 1, 8 and 14, the discussion above with regard to the independent claims and the cited references applies here. Because the combination of Chung and Tran does not contain limitations recited in Applicant’s independent claims as set forth above, and because Rappoport does not cure these deficiencies, the combination of Chung, Tran and Rappoport does not teach or suggest Applicant’s dependent claims. Therefore, Claims 2, 3, 9, 10, 15 and 16 are patentable over Chung in view of Tran and further in view of Rappoport.

CONCLUSION

In view of the foregoing, it is submitted that the claims are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date. If there are any fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. If a phone interview would expedite the prosecution of this Application, the Examiner is invited to contact the undersigned at (310) 207-3800.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP



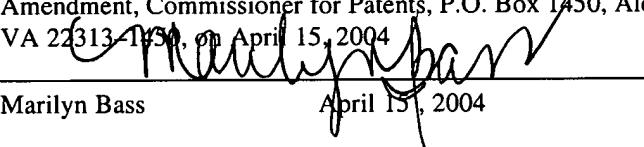
Walter T. Kim; Reg. No. 42,731

Dated: April 15, 2004

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CERTIFICATE OF MAILING:

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 15, 2004.



Marilyn Bass

April 15, 2004